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## PATENT SPECIFICATION

357,637



Application Date: June 27, 1930. No. 19,530 / 50.

Complete Left: March 19, 1931.

Complete Accepted: Sept. 28, 1931.

## PROVISIONAL SPECIFICATION.

## Improvements in, or relating to Ships, Motor Launches, and such like Craft.

I, PETER MATRICE STAUNTON, Aram Lodge, Castlerea, County Roscommon, Ireland, a British Subject, do hereby declare the nature of this invention to be as follows:—

I provide suitable close and fine formations, for example of the type known as "rasp teeth", on the bows of vessels, which will tend to retard and lessen the development of fluid pressures thereon, as

the vessels speed increases, by developing negative pressures between and over such formations. The object of this invention, which may be applied to the sides, as to the bows of ships, is to lessen the development of "wave making", and to reduce the "head", and other resistances now arising thereon.

Dated the 25th day of June, 1930.

PETER MAURICE STAUNTON.

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## COMPLETE SPECIFICATION.

## Improvements in, or relating to Ships, Motor Launches, and such like Craft.

I, PETER MATRICE STAUNTON, Aram Lodge, Castlerea, County Roscommon, Irish Free State, a British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

My invention relates to ships and other water craft of the type which are provided with surfaces other than smooth surfaces, for reducing the resistance offered by parts of the craft exposed to fluid action, and is especially applicable for use with existing high speed boats and vessels.

In craft of the above type, it has hitherto been proposed to form the hull of the vessel with plates of fish-scale formation for the purpose of reducing the resistance of the hull.

The object of my invention is to provide an improved construction of ship, motor launch or other water craft, by means of which construction, the speed of the craft may be increased, and the horse-power and fuel economies.

My invention consists in a ship, motor launch or other water craft having its hull or superstructure provided with surfaces having rasp-tooth formations or formations having spear-head entry portions and hollows to the rear of said portions.

With the craft now in use, the fluid

pressure acting on their smooth bows rapidly increase when high speeds are being got, a "Ploughing" action and consequent increase in the volume of water displaced by the bows develops, and with it Wave-making and Skin and Head resistances, much H.P. is consumed thereby, the Resistance curves rises rapidly, and further increments in speed soon become unattainable.

I would retard, and lessen the development of such increased fluid pressures, and of such "Ploughing" action and consequent resistance by covering the bows, or portions of them, not necessarily adjoining portions, with suitable plates having suitable close and fine formations on their exposed sides as above defined, which will, as the speeds increase, tend to develop low-pressure boundary layers over such formations, and "vacua", or partial vacua between them.

Referring now to the accompanying drawings,

Figure 1, shows a plan of part of a plate constructed according to my invention.

Figure 2, shows a part plan of the plate illustrated in figure 1, on an enlarged scale, while

Figure 3, shows a section through the line III—III, on figure 2.

Figure 4, shows an elevation, and figure 5 a plan of a vessel, the bows and funnel of which are fitted with plates.

according to my invention.

In carrying my invention into effect, according to one form, I construct plates with formations as illustrated in figures 5 1, 2 and 3. These formations consist of teeth, 1, such as are used, for example, on "Farriers Rasp," the sloping ends, 2, of the teeth facing in the ahead direction so that the water will be deflected by 10 the teeth from the hollows, 3, formed behind them.

It will be noted that this type of formation which, in my opinion has material advantages over any other for the purposes 15 aimed at, provides an easy "spearhead" entrance, a sloping, preferably slightly curved, deflecting surface, rising from the surface of the plate, and a hollow, immediately behind each tooth, below the 20 plate's surface, which gradually "rises" and narrows, until it reaches the plate's surface; that no "uncut" surface is left, and that the "churning" action of the teeth which may be mainly confined, with 25 high speeds, to their apices, will be cumulative, the object being thereby to develop low-pressure layers extending over the entire surfaces so treated, and to aid in the development of "vacua" within the 30 hollows.

I would preferably have the plates made of Bronze, Copper, Admiralty Metal, or other metal which will resist erosion, fairly soft, as polished as may be practicable, and unpainted.

The size of such teeth (which, with the hollows, may be constructed by any suitable means, and should cover the entire surface so treated) may be varied to suit 40 any given speed. For large high-speed craft such as Ocean Liners, it may be found advisable to use teeth about  $\frac{1}{4}$ " high by  $\frac{1}{4}$ " wide, with appropriate hollows behind each tooth. Or larger teeth, which 45 will tend to develop more vacua in the hollows behind them, rather than to develop low-pressure layers, may be used.

Such plates may be securely bolted on the <sup>bottom</sup> of existing craft, below and 50 above the water line, to whatever depth below, and height above may be found most useful for the purposes aimed at, or they may be substituted for the plating now used on vessels bows, in which latter 55 case I would have them somewhat thicker than would be required with ordinary plating, or they may be built as part of the ordinary structure of ships.

If they are used low down on the bows 60 they should, in my opinion, lessen the pitching now found to arise in rough weather.

For Cargo ships, and such like vessels which are run at cruising speeds, I would 65 use comparatively small, but well defined

and close formations, and to save the expense of docking when cleaning may be needed, I may limit the application of such plating to the portions 4 figures 4 and 5 of the bows which will be above the 70 ballast water line.

With Speed boats the entire fore part may be covered, including the bottom, but those are details to be determined experimentally.

The whole of the bows of all fast craft, above and below the water line should, in my opinion, be so covered, the formations above the line being, preferably, smaller and finer than those below. The front halves of Funnels as at 5 figures 4 and 5 may likewise be so treated, as may any other part of the superstructure exposed and set at a suitable angle to head winds, to admit of the formations acting as 85 described.

All such details may be determined as a result of experience. Trials may be readily made on a fairly fast motor launch, or with a model in a Tank, provided sufficiently high speeds are attainable. If model trials are made it should be noted that the formations must show negative results until sufficiently high speeds are got, that they should be well 90 defined and, in my opinion preferably, not smaller than those on a Farrier's rasp; that relatively better "results" may be expected with full-scale trials, and at speeds attainable with fast craft, and that, 95 whilst the low pressure layers might, conceivably, extend to the stern of a model, they should have ample time to subside on a ship before reaching her stern.

I would expect the efficiency of rasp-tooth formations to increase with their increased submersion.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is 110 to be performed, I declare that what I claim is:

1. A ship, motor launch or other water craft having its hull or superstructure provided with surfaces having rasp-tooth 115 formations, or formations having spearhead entry portions and hollows to the rear of said portions.

2. A ship, motor launch or other water craft, in which the bows or portions 120 thereof are formed with or are provided with plates having formations thereon according to claim 1.

3. A ship, motor launch or other water craft, in which the forward side portions 125 of the funnel, or portions of the superstructure against which head winds impinge at an angle, are formed with or are provided with plates having formations according to claim 1.

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4. Skin plates for ships, motor launches and as illustrated by the accompanying or other water craft, said plates having drawings.  
formations according to claim 1.

5. Improved plates, and water craft Dated the 18th day of March, 1931.  
5 fitted therewith substantially as described PETER MAURICE STAUNTON.

Redhill Printed for His Majesty's Stationery Office, by Love & Melomson, Ltd.—1931.

## 357,637 COMPLETE SPECIFICATION

1 SHEET

Fig. 1.

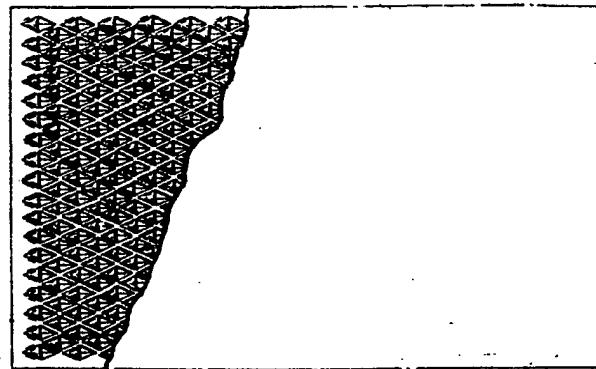


Fig. 2.

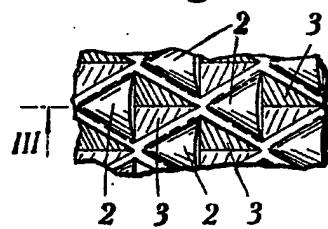


Fig. 3.

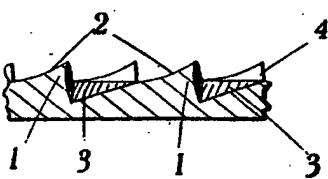


Fig. 4.

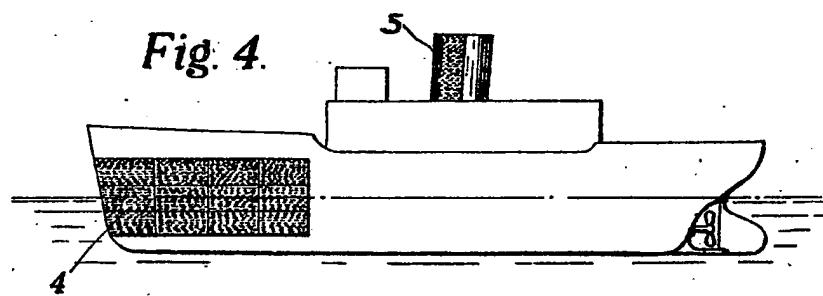
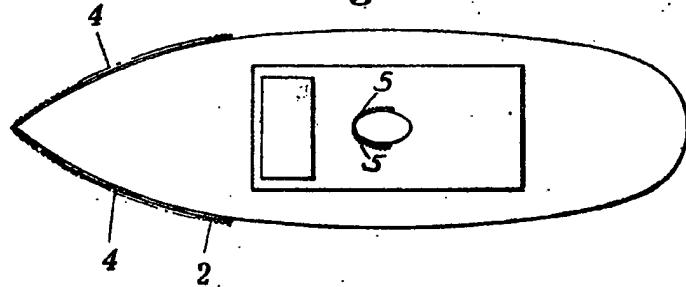


Fig. 5.



*[This Drawing is a reproduction of the Original on a reduced scale.]*